Bacteriology

I. Give the name for each of the following:

1- Many flagella covering the entire cell surface.

Peritrichous flagella

4- Thread- like structures used to adhere bacteria to one another during mating.

Sex pili

5- The organism that can grow in temperature above 80°C.

Extreme thermophile (thermococcus celer)

6- Organism grows where low concentration of oxygen has diffused into the medium.

Microaerophilic

7- An essential structure that protects the cell from mechanical damage and osmotic pressure.

Cell wall

8- A nutrient medium that allows only certain types of bacteria to grow, while inhibiting the growth of others.

Selective media

9- A polymer found in the cell walls of prokaryotes that consists of polysaccharide and peptide chains in a strong molecular network.

Peptidoglycan

10- An organism that can grow in extremely dry, desiccating conditions.

Xerophiles

II. Choose the correct Answer or Answers:

1. Which of the following procedures can be used to isolate a pure culture of a bacterium from a mixture?

a. Streak plating b. Dilution plating c. Enrichment culture d. All the above

a

2. Thirty-six colonies grew in nutrient agar from 1.0 ml of sample withdrawn from a solution diluted to 10^{-5} in a standard plate count procedure. How many cells were in the original sample?

a. 3,600 b. 3,600,000 c. 360,000 d. 1,800,000

b

3. An organism is capable of photosynthesis but use organic matter as carbon source.

Which type of metabolism does this organism possess?

a. Photolithotrophic autotroph b. Chemoorganotrophic heterotroph

c. Chemolithotrophic autotroph d. Photoorganotrophic heterotroph

d

4. Which of the following is used to grow bacterial cultures continuously?

a. Coulter Counter b. Chemostat c. Hemostat d. Petroff-Hausser chamber

b

5. Starvation proteins are produced by a culture during which of the following parts of growth curve.

a. Lag phase b. Stationary phase c. Log phase d. Death phase

b & d

6. Which of the following is not true about bacterial flagella?

a. Most of their length consists of a hollow, rigid protein tube.

b. They are constructed largely of a single protein called flagellin.

c. They spin like wheels, either clockwise or counterclockwise.

d. They use cytoplasmic ATP as their primary energy source

a

7. The 70 S prokaryotic ribosome consists of:

a. Two 40S subunit

b. A 50S and a 30S subunit

c. A 40S and a 30S subunit

d. A 50S and a 20S subunit

b

8. Which of the following is not true about capsules and slime layers?

a. They consist of secreted material lying outside of the bacterial cell wall.

b. They can prevent desiccation of bacterial cells.

c. They are required for bacteria to grow normally in culture**.**

d. They help bacteria resist phagocytosis by macrophages.

c

9. The term Psychrophiles refers to an organism that

a. Can grow at different temperature.

b. Has an optimum growth temperature between 0 to 15 °C.

c. Has an optimum growth temperature between 20 - 30°C.

d. Non of the above.

b

10. Which of the following properties describe MacConkey agar?

a. Supports growth of Mycobacteria

b. Contains mercury salts.

c. Indicates lactose fermentation

d. Contain antibiotics.

c

11. What is the purpose of bacterial endospores?

a. Allow the bacterium to make hundreds of "-seeds" to spread on the wind.

b. Help the bacterium to differentiate into faster growing stages of bacteria.

c. Allow the bacterium to survive the absence of oxygen.

d. Allow the bacterium to survive extended periods of heat or dryness.

d

12. An organism is capable of oxidizing H2S and using the energy obtained from the reaction to reduce carbon dioxide. Which type of metabolism does this organism possess?

a. Chemolithotrophic autotroph

b. Photolithotrophic autotroph

c. Chemoorganotrophic heterotroph

d. Photoorganotrophic heterotrophy

a

13. A microbiology student noticed that a Fluid Thioglycollate culture broth tube was very turbid at the surface and turbid throughout the rest of the tube. She can conclude that the

a. Broth is sterile.

b. Organisms cannot tolerate oxygen.

c. Organisms are facultative anaerobes.

d. Organisms are aerobes.

C

14. An experiment began with 4 cells and ended with 128 cells. How many generations did the cells go through?

a. 64 b. 5 c. 4 d. 32

b

15. Which of the following is not found in all bacterial cells?

a) Cell membrane b) ribosomes c) a nucleoid d) capsule

d

16. Which of the following is present in both Gram +ve and Gram –ve cell wall?

a) Outer membrane b) peptidoglycan c) teichoic acid d) lipopolysaccharides

B

17. Which of the following classes of organisms is dependent on organic molecules as both the source of energy and carbon?

a) Chemoheterotrophs b) chemolithotrophs c) photoheterotrophs d) photoautotrophs

a

18. Which of the following types of prokaryotes are most sensitive to oxygen?

a) Obligate aerobes b) obligate anerobes c) facultative anerobes d) photoautotrophs

b

19. Psychrophiles would be expected to grow :

a) In hot springs b) at low temperature c) on human body d) in high salt

B

20. The time required to a cell to undergo binary fission is called:

a) Exponential grow rate b) growth curve c) generation time d) log period

c

III. True or false:

1. During the stationary phase no new cells are being added to the population.
2. Beta hemolysis indicates a zone of clearing in blood agar produced by strept. Pneumonia.

3. Initial hump and terminal tailing in the survivor curve illustrate the presence of spores

True, false, false

IV. Complete:

1. **An organism that can synthesize all its required organic components from CO2 using energy from the sun is ……**

Photoautotroph

2. **The forms of endocytosis are ……., ……..and……**

Phagocytosis, pinocytosis, receptor mediated endocytosis

3. **Among human pathogens bacteria, only the genera……..and……..produce spores.**

Bacillus and clostridium

4. **The generation time (g) can be determined by applying the equation……..**

G= t/n

5. **Growth factors fall in 3 main groups ……..,……..and……**

Macronutrients, trace elements and growth factors

6. **Water activity AW=…….**

P/p^0 (the amount of water available for microorganism. Aw (water activity) for pure H2O =1.0 that affected by dissolved solutes such as salts or sugars.